INSYS MICROELECTRONICS

AT Commands

INSYS GPRS/EDGE 5.0 serial

Apr-10

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Publisher:
INSYS MICROELECTRONICS GmbH
Waffnergasse 8
D-93047 Regensburg, Germany
Phone: +49 (0)941/56 00 61
Fax: +49 (0)941/56 34 71
E-mail: insys@insys-tec.de
Internet: http://www.insys-tec.de

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1 General

All INSYS communication devices are controlled internally via **AT** commands. To enter AT commands directly we recommend the use of the terminal program TeraTerm by T. Teranishi. The free software can be downloaded at http://www.vector.co.jp/authors/VA002416/teraterm.html.

Each **AT** command starts with the letters **AT** and ends with a “Carriage Return” (CR). Capital and small letters will both be accepted, but the leading characters must be either ‘**AT**’ or ‘**at**’. The command line is evaluated after the modem receives a return command. In the description, a parameter with the letter **<n>** means that it can have various values.

For example **AT&C<n>**, where '**n**' can have the value 0 or 1, e.g. **AT&C1** (DCD always on). For commands which expect a parameter but don't have a parameter, the modem will automatically assume the parameter 0. For example, the commands **AT&D** and **AT&D0** will have the same effect.

The factory settings are marked “(default)”.

The commands are acknowledged with “**OK**” or “**ERROR**”. A command that is being edited will be interrupted by any further incoming character. Therefore, the next command must wait for acknowledgement to avoid the deletion of the current command.

Response	Code	Type	Meaning
OK	0	Final	Command executed, no error
CONNECT	1	Final	Connection established if parameter setting X=0
CONNECT[<text>]		Final	Connection established if parameter setting X>0 **<text>**: E.g. '**connect 9600**'. The data transmission rate is then 9.600 bit/s.
RING	2	Non-synchro-nized	Ring tone recognized
NO CARRIER	3	Final	Connection not established or disconnected
ERROR	4	Final	Invalid command or command line too long
NO DIALTONE	5	Final	No dial tone, connection setup not successful, wrong operating mode
BUSY	6	Final	Remote terminal busy
NO ANSWER	7	Final	Timeout for connection setup

The standard **AT** commands can be entered locally via the serial interface if the device is in offline state. In the online command mode, only the commands **ATH** and **ATO** are available.

The INSYS **AT**** commands can be entered locally as well as remote (remote configuration) and in most cases also via SMS. The configuration via SMS is restricted to commands with responses of up to 140 characters.

To ease the legibility of the further comments, **<CR>** (carriage return) is always used as end-of-line character, and the standard responses **OK** or **ERROR** are used as responses, regardless of the actually selected responses according to V.25.

Note

Lining up several commands per input line is usually not possible Further commands can be sent only after the processing of the previous command is completed with the output of the response.

For the lining up of standard AT commands, please find a description in the command set of the GSM engine. This information is provided only on request, as this command set is subject to the Siemens duty of non-disclosure.

1.1 Non-synchronized Event Codes (URC)

Apart from the non-synchronized event codes of the GSM engine, the advanced options by INSYS offer the following messages:

URC	Code	Type	Meaning
+PPP-IP SETUP	11	Non-synchronized	In operating mode TCP Listen (**AT**TCPLISTEN**), the PPP connection was successfully established, an IP address was received, and the device can be reached via a TCP connection.
+PPP-IP RELEASE	12	Non-synchronized	In the operating mode TCP Listen (**AT**TCPLISTEN**), the PPP connection was terminated and the device can no longer be reached.
+PPP-IP OK	13	Non-synchronized	In the operating mode TCP-Listen (**AT**TCPLISTEN)** , the connection check for the GPRS network (**AT**PPPIPCHECK**) was successfully performed in offline state (during a PPPIP connection).

2 Short Description INSYS AT Commands

2.1 Overview

Command	Short description	Implementation possible				
		Offline local	Offline local for active PPP connection (TCP Listen)	Online local	Remote	SMS
ATD	Establish CSD or "TCP transparent" connections	X	X			X
ATH	Terminate CSD or "TCP transparent" connections	X	X	X		X
ATA	Accept CSD or "TCP transparent" connections	X	X			
AT**AUTOCSD	AutoDial CSD destination number	X	X	X	X	X
AT**AUTOIP	AutoDial destination: IP address	X	X	X	X	X
AT**AUTOPORTIP	AutoDial destination port for destination IP	X	X	X	X	X
AT**AUTOURL	AutoDial destination: domain name	X	X	X	X	X
AT**AUTOPORTURL	AutoDial destination port for domain name	X	X	X	X	X
AT**BAUD	Baud rate of the serial interface	X			X	X
AT**CALLBACK	AutoDial function callback	X	X	X	X	X
AT**CLIP	Selective call answer	X	X	X	X	X
AT**CSDPRIO	Termination of GPRS connections for incoming CSD calls	X	X	X	X	X
AT**DEFAULT	Factory settings of the INSYS AT commands	X	X	X	X	X
AT**DIALIN	Dial-in type for integrated TCP/IP stack	X		X	X	X
AT**DIALINNR	Dial-in number for integrated TCP/IP stack	X	X	X	X	X
AT**EXIT	Exit remote command mode				X	
AT**FLASH	Firmware update of the µcontroller	X	X		X	
AT**FORMAT	Data format of the serial interface	X	X	X	X	X
AT**GPRSAPN	GPRS-APN for integrated TCP/IP stack	X	X	X	X	X
AT**GSMNET	Display of GSM network parameters	X	X	X	X	X
AT**GSMREQ	Query interval for automatic SMS processing and reading the network parameters	X	X	X	X	X
AT**IMEI	Display of device IMEI	X	X	X	X	X

Command	Short description	Implementation possible				
		Offline local	Offline local for active PPP connection (TCP Listen)	Online local	Remote	SMS
ATIMSI**	Display of SIM-IMSI	X	X	X	X	X
ATIN**	Query of the switch inputs	X	X	X	X	X
ATINPUT**	Determine event handling for inputs	X	X	X	X	X
ATINPUTCHANGE**	Transmitting the input state for changes at the input level	X	X	X	X	X
ATINPUTTIMEOUT**	Periodic transmission of the input states	X	X	X	X	X
ATKEEP**	TCP Keep Alive	X	X	X	X	X
ATLASTCON**	Display of information about the last connection	X	X	X	X	X
ATLL**	AutoDial function leased line	X		X	X	X
ATLLWAITRST**	Number of failed dialup attempts until reset in Leased Line mode	X	X	X	X	X
ATLLWAIT**	Incrementation of the waiting period between leased line dial-up attempts	X	X	X	X	X
ATLOGOUT**	Timer-controlled log-out/login	X	X	X	X	X
ATOUT**	Set/reset the switch outputs	X	X	X	X	X
ATPASSC**	Configuration password	X	X	X	X	X
ATPIN**	SIM card PIN	X	X	X	X	X
ATPPPAUTH**	PPP authentification type for integrated TCP/IP stack	X			X	X
ATPPPPW**	PPP password for integrated TCP/IP stack	X	X	X	X	X
ATPPPUSER**	PPP user name for integrated TCP/IP stack	X	X	X	X	X
ATPPPIPCHECK**	PPP connection check for operating mode TCP Listen		X			X
ATPROFILE**	Display settings	X	X	X	X	
ATPROVIDER**	GSM network provider selection	X	X	X	X	X
ATRESET**	Restart	X	X	X	X	X
ATS0**	Number of ring tones before automatic call acceptance	X	X	X	X	X
ATSAVE**	Save the extended INSYS settings	X	X	X	X	X
ATSCN**	SMS service center number	X	X	X	X	X
ATSIGNAL**	GSM signal field strength	X	X	X	X	X
ATSMSRX**	Automatic SMS reception processing	X	X	X	X	X

Command	Short description	Implementation possible				
		Offline local	Offline local for active PPP connection (TCP Listen)	Online local	Remote	SMS
ATTCPAGG**	TCP block formation timer of the integrated TCP/IP stack:	X	X	X	X	X
ATTCPBLOCK**	TCP block size of the integrated TCP/IP stack	X	X	X	X	X
ATTCPLISTEN**	Operating mode TCP Listen	X	X	X	X	X
ATTCPLISTENPORT**	TCP data port for incoming TCP connections in the operating mode TCP Listen	X	X	X	X	X
ATTCPLISTENWAITRST**	Number of failed dialup attempts until reset in TCP Listen mode	X	X	X	X	X
ATVCOM**	Support of the INSYS virtual COM port driver	X	X	X	X	X
ATVCOMPORT**	UDP destination port for the information about the IP address for TCP Listen	X	X	X	X	X
ATVCOMIP**	UDP destination IP address for the information about the IP address for TCP Listen	X	X	X	X	X
ATVCOMURL**	UDP destination URL for the information about the IP address for TCP Listen	X	X	X	X	X
ATVCOMTIMEOUT**	Timeout for TCP variant for authentification at the virtual COM port	X	X	X	X	X
ATVERSION**	Display of the software version	X	X	X	X	X

X = implemented/enabled

2.2 Availability/Storage

The following INSYS AT commands are saved immediately after they are entered without **AT**SAVE**, but only activated after a restart.

- **AT**PROVIDER**
- **AT**PIN**
- **AT**GPRSAPN**
- **AT**PPPAUTH**

The following settings are immediately saved when entered, and active:

- **AT**BAUD**
- **AT**FORMAT**

The other settings are immediately accepted and first stored permanently with **AT**SAVE**.

3 Description of the AT Commands

3.1 INSYS AT Commands

ATAUTOCSD**	AutoDial CSD destination number
Read:	**AT**AUTOCSD?** Response: **AUTOCSD: <number>** **OK**
Write:	**AT**AUTOCSD=<number>** Parameters: **<number>** Phone number which is called as CSD connection for the Auto-Dial functions callback or leased line. The maximum length is 20 characters.
Delete:	**AT**AUTOCSD=** After "**=**", the input line is completed with **<CR>**.
Default:	Empty

ATAUTOIP**	AutoDial destination IP
Read:	**AT**AUTOIP?** Response: **AUTOIP1: <ip1>** **AUTOIP2: <ip2>** **OK**
Write:	**AT**AUTOIP[<index>]=<ip>** Parameters: **<index>** 1 Main destination address 2 Alternative address which is contacted if the main destination can not be reached. If **<index>** is not specified, the main destination address 1 is used. **<ip>** IP address which is called for the AutoDial functions callback or leased line or via an event at the event input as "TCP transparent" IP connection, e.g. **AT**AUTOIP=213.7.0.46**
Delete:	**AT**AUTOIP[<index>]=** After "**=**", the input line is completed with **<CR>**.
Default:	0.0.0.0 0.0.0.0

ATAUTOPORTIP**	AutoDial destination port for destination IP
Read:	**AT**AUTOPORTIP?** Response: **AUTOPORTIP1: <port>** **AUTOPORTIP2: <port>** **OK**
Write:	**AT**AUTOPORTIP[<index>]=<port>** Parameters: **<index>** 1 Main destination port to the main destination address 2 Alternative port to the Alternative address, which is contacted if the main destination address can not be reached. If **<index>** is not specified, the main destination port 1 is used. **<port>** TCP-Port, to which a "TCP transparent" IP connection will be established for the AutoDial functions callback or leased line or via an event at the input. Values from 1...65535.
Delete:	**AT**AUTOPORTIP[<index>]=** After "**=**", the input line is completed with **<CR>**.
Default:	0 0

ATAUTOURL**	AutoDial destination: domain name
Read:	**AT**AUTOURL?** Response: **AUTOURL1: <domain>** **AUTOURL2: <domain>** **OK**
Write:	**AT**AUTOURL[<index>]=<domain>** Parameters: **<index>** 1 Main destination address (domain name) 2 Alternative address (domain name), which is contacted if the main destination address can not be reached. If **<index>** is not specified, the main destination address 1 is used. **<domain>** Domain name, to which the AutoDial functions callback or leased line or via an event at the input will establish a "TCP transparent" connection. The maximum length is 30 characters. E.g. **AT**AUTOURL=controlcenter.dyndns.org**
Delete:	**AT**AUTOURL[<index>]=** After "**=**", the input line is completed with **<CR>**.
Default:	Empty

ATAUTOPORTURL**	AutoDial destination: Port for domain name
Read:	**AT**AUTOPORTURL?** Response: **AUTOPORTURL1: <port>** **AUTOPORTURL2: <port>** **OK**
Write:	**AT**AUTOPORTIP[<index>]=<port>** Parameters: **<index>** 1 Main destination port to the main destination address (domain name) 2 Alternative port to the Alternative address (domain name), which is contacted, if the main destination address cannot be contacted. If **<index>** is not specified, the main destination port 1 is used. **<port>** TCP-Port, to which a "TCP transparent" connection will be established for the AutoDial functions callback or leased line or via an event at the input. Values from 1...65535.
Delete:	**AT**AUTOPORTURL[<index>]=** After "**=**", the input line is completed with **<CR>**.
Default:	0

ATBAUD**	Baud rate at the serial interface
Read:	**AT**BAUD?** Response: **BAUD: <baud>** **OK**
Write:	**AT**BAUD=<baud>** Parameters: **<baud>** 300 300 bps 600 600 bps 1200 1200 bps 2400 2400 bps 4800 4800 bps 9600 9600 bps 14400 14400 bps 19200 19200 bps 28800 28800 bps 38400 38400 bps 57600 57600 bps 115200 115200 bps For local or SMS configuration, the output of the response takes place with the old baud rate; the baud rate will be changed immediately after. For remote configuration, the change takes place after a reset of the device only.
Default:	**AT**BAUD=19200**

ATCALLBACK**	Callback
Read:	**AT**CALLBACK?** Response: **AT**CALLBACK=<callback_clip1>,<callback_clip2>,<callback_clip3>** **OK**
Write:	**AT**CALLBACK=<callback_clip1>[,<callback_clip2>[,<callback_clip3>]]** An action is assigned to the according CLIP (**AT**CLIP1/2/3**), which is performed when a call from this phone number is indicated. Parameters: **<callback_clip1/2/3>** **0:** No callback action; clip serves as call protection only **1:** CSD callback; the number after **AT**AUTOCSD** is called **2:** IP callback: IP address and IP port after **AT**AUTOIP1** / **AT**AUTOPORTIP1** are contacted **3:** Domain name callback to the domain name and IP port, which are stored with **AT**AUTOURL1** and **AT**AUTOPORTURL1**. 4: Not allowed 5: IP callback: IP address and IP port behind **AT**AUTOIP2** / **AT**AUTOPORTIP2** are contacted **6:** Domain name callback to the domain name and IP port, which are stored with **AT**AUTOURL2** and **AT**AUTOPORTURL2**. The activation and configuration of the selective call acceptance (**AT**CLIP**) is required for the function callback.
Delete:	**AT**CALLBACK=** After "**=**", the input line is completed with **<CR>**.
Default:	**AT**CALLBACK=0,0,0**

ATCLIP**	Selective call acceptance for connections and SMS processing
Read:	**AT**CLIP?** Detect phone numbers. Response: **CLIP: <status>** **CLIP 1: <number>** **CLIP 2: <number>** **CLIP 3: <number>** **OK** Parameters: **<status>** **0** Selective call acceptance inactive **1** Selective call acceptance active
Write:	**AT**CLIP=<status>** Enable / disable call acceptance Parameters: **<status>** **0** Selective call acceptance inactive **1** Selective call acceptance active **AT**CLIP<index>=<number>** Enter allowed phone numbers Parameters: **<index>** **1** ... **3** 3 entries for phone numbers **99** Delete complete list **<number>** Phone number, which is authorized for a call or an SMS for the INSYS GPRS 5.0 serial. The maximum length is 20 characters. It is possible to allow whole blocks of numbers: The wildcard character "*****" stands for exactly one digit. The caller has to activate the calling line identification presentation (CLIP) to use this security function. The selective call acceptance is only active after a device reset. The GSM engine works with the setting **AT+CLIP=1** then. The phone number is displayed in connection with the "**RING**" message for each incoming call. Example: **RING** **+CLIP: "+49941560061",145,,,,0** The allowed number has to be entered in exactly the same format as it is output for a call with "+CLIP: ...." (without ""). **Note:** **The transmitted format of the number may depend on the provider – e.g. the leading "+49" may be replaced by "0049". We therefore urgently recommend verifying the entry by placing a test call.** Incoming calls of numbers which are not allowed are displayed until the caller ends the signaling. They can neither be accepted manually (**ATA**). The caller receives the busy signal **BUSY**.
Delete:	**AT**CLIP=** The selective call acceptance is deactivated. **AT**CLIP<index>=** The single entry will be deleted. **AT**CLIP99=** Deletes the complete list. After "**=**", the input line is completed with **<CR>**.
Default:	Inactive, all numbers empty

ATCSDPRIO**	Termination of GPRS connections for incoming CSD calls
Read:	**AT**CSDPRIO?** Response: **CSDPRIO: <mode>** **OK**
Write:	**AT**CSDPRIO=<mode>** Parameters: **<mode>** 0 GPRS connections are not terminated by incoming CSD calls 1 GPRS connections are terminated by incoming CSD calls with authentication 2 GPRS connections are terminated by incoming CSD calls without caller authentication. No special number must be stored. To use this function, the function selective call acceptance (**AT**CLIP)** must be activated. The GSM/GPRS provider must support the service that during an active GPRS session the CSD RING signalling to the end device is forwarded. **Note:** **To ensure full functionality, please set the minimum number of rings for automatic call acceptance to three (ATS0=3).**
Delete:	**AT**CSDPRIO=** After "**=**", the input line is completed with **<CR>**.
Default:	0
ATDEFAULT**	Load factory settings
Write:	**AT**DEFAULT** The following factory settings for the **AT**** commands are set. See also **AT&F** **BAUD: 19200** **FORMAT: 8N1** **SCN:** **PROVIDER: 0** **LOGOUT: 0** **GSMREQ: 60** **SMSRX: 1** **PASSC: inactive** **CLIP: inactive** **CLIP 1:** **CLIP 2:** **CLIP 3:** **DIALIN: 1**

```
DIALINNR:
GPRSAPN:

PPPAUTH: 0
PPPUSER:
PPPPW:

VCOM: 1,0,1
VCOMPORT: 0
VCOMIP: 0.0.0.0
VCOMURL: KEEP: 0
VCOMTIMEOUT: 10

KEEP: 0
TCPAGG: 100
TCPBLOCK : 512

CSDPRIO: 0

TCPLISTEN: 0
TCPLISTENPORT: 1234

PPPIPCHECK: 0

AUTOCSD:
AUTOIP1: 0.0.0.0
AUTOIP2: 0.0.0.0
AUTOPORTIP1: 0
AUTOPORTIP2: 0
AUTOURL1:
AUTOURL2:
AUTOPORTURL1: 0
AUTOPORTURL2: 0

CALLBACK: 0,0,0

LL1: 0
LL2: 0
LLWAITRST: 255
TCPLISTENWAITRST: 255
INPUT 1: 0
INPUT 2: 0
INPUTTIMEOUT: 0
INPUTCHANGE: 0
```

Notes: **A set PIN will not be deleted (see `AT**PIN`).**
After the command has been executed, the INSYS GPRS 5.0 serial will automatically initiate a restart to correctly implement the changed settings and to re-initialize the GSM/GPRS engine!

ATDIALIN**	Services for integrated TCP/IP connection
Read:	**AT**DIALIN?** Response: **DIALIN: <mode>** **OK**
Write:	**AT**DIALIN=<mode>** Parameters: **<mode>** 0 Dialup via GSM CSD connection 1 Dialup via GPRS connection
Delete:	**AT**DIALIN=** After "**=**", the input line is completed with **<CR>**.
Default:	1
ATDIALINNR**	Dial-in number of the TCP/IP provider
Read:	**AT**DIALINNR?** Response: **DIALINNR: <number>** **OK**
Write:	**AT**DIALINNR=<number>** Parameters: **<number>** Phone number that marks the PPP remote terminal for the dialup for the usage of the integrated TCP/IP stack. When dialling in via GPRS (**AT**DIALIN=1**) this must be***99***1#**. When dialling in via GSM CSD, the number of the used ISP must be used. Many ISP offer special speed dialling numbers for GSM, such as 22243 for Freenet.
Delete:	**AT**DIALINNR=** After "**=**", the input line is completed with **<CR>**.
Default:	Empty

ATEXIT**	**Exit remote command mode**
Execute:	**AT**EXIT** Response: **OK** Response for input failure / not in remote configuration mode: **ERROR** After this command is executed correctly, the INSYS GPRS 5.0 serial returns to data transmission mode. **Note: This command cannot be executed via SMS.**
ATFLASH**	Firmware update of the controller
Execute:	The firmware of the µcontroller can be loaded locally (via the serial interface), and remote (CSD or "TCP transparent" connection). **Note: The use of hardware handshake is absolutely necessary; make sure that for remote flash the modem of the remote terminal is set to hardware handshake as well as the terminal program.** The command **AT**FLASH** will start the upload process and the device will prepare itself for receiving the firmware. After the response Send ***.HEX file now** the firmware (file with the ending ***.hex**) is sent as a text file. **Note: Depending on the loaded firmware version, the settings for the extended functions are reset to factory settings after the update. Please note this when performing a remote update.** **The SIM card PIN (AT**PIN) and the standard command settings of the GSM/GPRS engine are maintained, which means that if automatic call acceptance (e.g. ATS0=2) is activated, the device can still be accessed from outside to enable the re-configuration of the extended functions per CSD call via remote configuration.** Routine: Entry: **AT**FLASH** Response (after approx. 6 seconds): **Send *.HEX file now.** **Send firmware file as text file (not binary).** Response: **Upload OK. Updating FW...** **Note: After the file has been received the device needs up to 60 seconds to complete the update. Afterwards, the (INSYS GPRS 5.0 serial will automatically perform a restart.** **This command cannot be executed via SMS.**

ATFORMAT**	Data format of the serial interface
Read:	**AT**FORMAT?** Response: **FORMAT: <format>** **OK**
Write:	**AT**FORMAT=<format>** Parameters: **<format>** **8N1** 8 data bits, 1 stop bit, no parity **8E1** 8 data bits, 1 stop bit, even parity **8O1** 8 data bits, 1 stop bit, odd parity **8N2** 8 data bits, 2 stop bit, no parity **7E1** 7 data bits, 1 stop bit, even parity **7O1** 7 data bits, 1 stop bit, odd parity **7N2** 7 data bits, 2 stop bit, no parity **7E2** 7 data bits, 2 stop bit, even parity During local configuration the response at the serial interface is output with the old data format. The data format will be changed afterwards. For remote configuration, the changes will be active after a reset of the device only.
Default:	**AT**FORMAT=8N1**
ATGPRSAPN**	GPRS-APN for integrated TCP/IP stack
Read:	**AT**GPRSAPN?** Response: **GPRSAPM: <apn>** **OK**
Write:	**AT**GPRSAPN=<apn>** Parameters: **<apn>** APN (Access Point Name) of the GPRS provider. Maximum length 30 characters. E.g. **web.vodafone.de** **Note: Some providers offer various APNs which sometimes also distinguish themselves by different QoS. If necessary, ask your provider about which APN is the most suitable for your application.**
Delete:	**AT**GPRSAPN=** After "**=**", the input line is completed with **<CR>**.
Default:	Empty

ATGSMNET?**	Display of GSM network parameters
Read:	**AT**GSMNET?** Response: **SIGNAL: 26** **BER: 0** **REG: 1** **OPER: 0,0,"Vodafone.de"** **MCC: 262** **MNC: 2** **LAC: 035D** **CELL: 64C9** **BSIC: 64** **CHANN: 71** **RSSI: 48** **C1: 44** **C2: 0** **OK** The parameters are updated using the **AT**GSMREQ** interval.

ATGSMREQ**	Query interval for automatic SMS processing and reading the network parameters
Read:	**AT**GSMREQ?** Response: **GSMREQ: <interval>** **OK**
Write:	**AT**GSMREQ=<interval>** Parameters: **<interval>** **20** … **60** Update interval in seconds **Note: The automatic query of the GSM network parameters and incoming SMS in adjustable intervals (AT**GSMREQ) through the controller takes place via an independent module-internal interface and usually has no effect on the communication between the application and GSM/GPRS.** Only when the SMS memory is accessed (especially reading and deleting), it can happen that the µcontroller accesses the SMS storage location at the same time. In this case, the application would receive ERROR as response. The application should therefore execute the command once more, if necessary.
Default:	**AT**GSMREQ=60**
ATIMEI?**	Display of the device IMEI
Read:	**AT**IMEI?** Response: **IMEI: <imei>** **OK** The IMEI is a 15 digit number which is unique for each GSM/GPRS device and can therefore be used to identify a GSM/GPRS end device.
ATIMSI?**	Display of SIM IMSI
Read:	**AT**IMSI?** Response: **IMSI: <imsi>** **OK** The IMSI is a 15 digit number which is unique for each GSM/GPRS SIM card and can therefore be used to identify a GSM/GPRS SIM card.

ATIN**	Query of the switch inputs
Read:	**AT**IN?** Response: **IN1: <status>** **IN2: <status>** **OK** Parameters: **<status>** **0** Switch input operated: Switch input connected to GND. **1** Idle state: Switch input open (not connected to GND): internal pull-up resistor available.
ATINPUT<x>=<n>**	Activation of the event behavior at inputs
Read:	**AT**INPUT?** Response: **INPUT1: x** **INPUT2: y** **OK**
Write:	**AT**INPUT<x>=<n>** Parameters: **<x>** = Input 1 = Input 1 2 = Input 2 **<n>** Selection of the event behavior 1 SMS dispatch 2 IP connection to **AT**AUTOIP** 3 URL connection to **AT**AUTOURL** 4 – 5 IP connection to **AT**AUTOIP2** 6 URL connection to **AT**AUTOURL2** 7 – 8 IO tunneling via TCP/IP connection

Schreiben: *(continuation)*	**After activating the SMS dispatch, an SMS can be sent with a fixed text, if the input UE is put on GND potential for > 300 ms.** **The following settings must me entered (in this example, the order must be kept):** **AT**INPUT1=1** **AT**INPUT1=2** **AT+CPMS=MT,MT,MT** **AT+CMGF=1** **AT+CMGD=1** **AT+CMGF=2** **AT+CSCA=<SCNR>** **AT+CMGW=<nr>** **> <text message 1>** **<Ctrl+Z>** **OK** **AT+CMGW=<nr>** **> <text message 2>** **<Ctrl+Z>** **OK** **AT**SAVE** **AT&W** **AT**RESET**
Delete:	**AT**INPUT=** After "=", the input line is completed with <CR>.
Default:	0

ATINPUTCHANGE**	Transmitting the input state for changes at the input level
Read:	**AT**INPUTCHANGE** Response: **INPUTCHANGE: 1/0**
Write:	**AT**INPUTCHANGE<n>** Parameters: **<n>** = Activate/deactivate 1 = Activate 0 = Deactivate This change will be effective immediately. The setting **AT**INPUT<x>=8** is required.
Save	**AT**SAVE**
Default:	0
ATINPUTTIMEOUT**	Periodic transmitting of the input state
Read:	**AT**INPUTTIMEOUT** Response: **INPUTTIMEOUT: xxx**
Write:	**AT**INPUTTIMEOUT=<n>** Parameters: **<n>** = Time in minutes 1 = Activate 0 = Deactivate This change will be effective immediately. The setting **AT**INPUT<x>=8** is required.
Delete:	**AT**INPUTTIMEOUT=0**
Save	**AT**SAVE**
Default:	0

ATKEEP**	TCP Keep Alive
Read:	**AT**KEEP?** Response: **KEEP: <interval>** **OK**
Write:	**AT**KEEP=<interval>** Parameters: **<interval>** **0** Do not send TCP Keep Alive packets **1…255** Time periods between two monitoring packets in units of 1 minute This timer enables the monitoring of an existing TCP/IP connection when no data is transferred. If 3 consecutive monitoring packets are not answered, the connection is terminated. If the device is configured as a leased line device, the connection will then be re-established. Keep Alive will mostly be used for leased line connections, because the application on location is usually not able to assume the connection control and monitoring. **Note: Keep Alive generates traffic; in principle, each Keep Alive packet is an empty TCP/IP message which must be confirmed. For one Keep Alive two empty TCP/IP messages with 40 bytes each are required.** When selecting the timeouts, besides ensuring that the connection is monitored, the pricing of the current GPRS contract must also be considered.
Delete:	**AT**KEEP=** After "**=**", the input line is completed with **<CR>**.
Default:	0

ATLASTCON?**	Display of information about the last connection
Read:	**AT**LASTCON?** Response without previous connection: **TP: NONE** **RC: NONE** **RD: NONE** **DN:** **DI: 0.0.0.0** **DP: 0** **SI: 0.0.0.0** **SP: 0** **OK** Response for outgoing CSD connections: **TP: <type>** **RC: <reason connect>** **RD: <reason disconnect>** **DN: <dest nr>** **OK** Response for incoming CSD connections: **TP: <type>** **RC: <reason connect>** **RD: <reason disconnect>** **SN: <source nr>** **OK** Response for "TCP transparent" IP connections: **RC: <reason connect>** **RD: <reason disconnect>** **DN: <dest nr>** **DI: <dest ip>** **DP: <dest port>** **SI: <source ip>** **SP: <source port>** **OK**

Read:
(Continuation)

Response for "TCP transparent" connections to a domain name:

```
TP: <type>
RC: <reason connect>
RD: <reason disconnect>
DN: <dest nr>
DU: <dest domain>
DI: <dest ip>
DP: <dest port>
SI: <source ip>
SP: <source port>

OK
```

Parameters:

<type>:	**CSD**	**CSD connection**
	IP	**"TCP Transparent"**

IP connection

	IPURL	"TCP transparent" connection to a domain
	PPPIP	Establishing the PPP connection for TCP Listen
	PPPCHK	Performing the connection monitoring for TCP Listen

<reason connect>:	**IN**	Incoming connection (only CSD)
	OUTMANU	Manual dialling via **ATD**
	OUTAUTO	Dialling via AutoDial function callback or LL (dedicated line), or TCP Listen with destination **AT**AUTOCSD**, **AT**AUTOIP** / **AT**AUTOPORTIP** or **AT**AUTOURL** / **AT**AUTOPORTURL**

<reason disconnect>:

General:

ALARM	Connection has been terminated to be able to set-up an alarm connection
ATH	Local connection (in online command mode) terminated due to hang up via **ATH**
CLIP	Connection has been rejected with enabled selective call acceptance
CSD	Remote terminal has hung up or the connection/connection setup was terminated on the GSM-side

Read: *(Continuation)*	**<reason disconnect>:**		
	General:		
		CSDPRIO	GPRS connection has been terminated by an incoming CSD call
		DNS	DNS look-up has failed
		DNSVC	Information about the just assigned IP address after PPP dial-in via the DYN-IP function has failed, because the target domain could not be resolved via a DNS request
		DTR	Connection terminated by locally hanging up via DTR drop (setting `AT&D2`)
		IPTMTWO	Maintenance window has expired; device has logged off from the spare IPT Master
		KEY	A character has been sent on the serial interface during connection set-up
		LISTEN	TCO Listen mode has been terminated
		LL	Leased line mode has been terminated
		LOGOUT	Expiry of the timer for the periodic logout
		NONE	Connection still active (query in online command mode)
		PPP	Connection set-up has failed on PPP side
		PPPCHK	Connection monitoring of the PPP connection not successful
		TCP	Connection set-up has failed on TCP side or existing connection terminated on TCP side or timeout
		TSC/IPT	Disconnection of the connection by the TSC/IPT protocol stack
		VCOM	Timeout of the reply on the IMEI information
	<dest domain>:		**Only for "TCP transparent" connection to a domain:** Remote terminal domain name
	<dest ip>:		**Only for "TCP Transparent" connection:** IP remote terminal address; is only entered for a connection to a domain name if the DNS request was successful**.**
	<dest port>:		**Only for "TCP Transparent" connection:** Remote terminal TCP port
	<source ip>:		**Only for "TCP Transparent" connection:** Own IP address; is dynamically allocated when the PPP connection is established and then entered

Read: *(Continuation)*	**<source port>:** Response (example): **TP: IP** **RC: OUT MANU** **RD: TCP** **DN: *99***1#** **DI: 200.70.12.34** **DP: 12000** **SI: 10.225.39.246** **SP: 8000** **OK**	**Only for "TCP Transparent" connection:** Own TCP port; is automatically selected from the TCP protocol stack and only entered after the TCP connection has been established.

ATLL**	AutoDial function leased line		
Read:	**AT**LL?** Response: **LL1: <ll_action>** **LL2: <ll_action>** **OK**		
Write:	**AT**LL<index>=<ll_action>** Parameters: **<index>:**	**1**	Main access for leased line operation for the destination addresses defined with **AT**AUTOCSD**, **AT**AUTOIP,** **AT**AUTOPORTIP**, **AT**AUTOURL,** or **AT**AUTOPORTURL**
		2	Alternative access for leased line operation for the target addresses defined with **AT**AUTOIP**, **AT**AUTOPORTIP,** **AT**AUTOURL,** or **AT**AUTOPORTURL**
	<ll_action>:		
		0	No leased line function
		1	CSD; the number after **AT**AUTOCSD** is called
		2	IP; IP address and TCP-Port after **AT**AUTOIP1** and **AT**AUTOPORTIP1** are contacted
		3	Callback to domain name and TCP port as stored in **AT**AUTOURL1** and **AT**AUTOPORTURL1** contacted.
		4	Not allowed.
		5	IP; IP address and TCP-Port after **AT**AUTOIP2** and **AT**AUTOPORTIP2** are contacted
		3	Callback to domain name and TCP port as stored in **AT**AUTOURL2** and **AT**AUTOPORTURL2** contacted.
	The first attempt to establish a connection starts 20s after the device has been booted (DSR active) or 20s after activating the main input with **AT**LL1=x**.		

Write:

(Continuation)

If only **AT**LL2** is used without **AT**LL1**, this will not result in a function!

The connection setup and the connection itself are monitored.

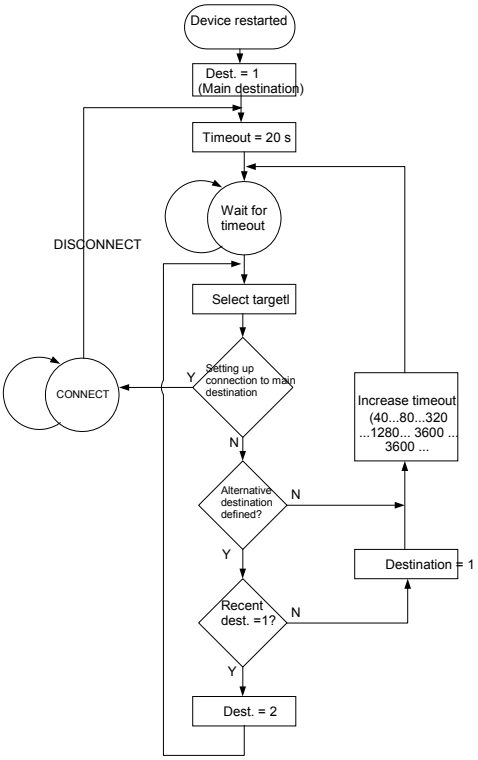
If the connection can not be established (network failure, remote system does not respond) or if the connection is terminated, the INSYS GPRS 5.0 serial will automatically start reconnecting.

To limit the connection costs for inaccessible remote terminals (for each connection setup data packets are created and billed), the delay time will increase for every new repeated attempt:.

- 20 seconds after restart or if the last connection setup was successful
- 80 seconds after the first failure
- 320 seconds after the second failure
- 1280 seconds after the third failure
- 1 hour for each additional failure
- If the maximum number of dialling attempts is reached with the command **AT**LLWAITRST**, the device is restarted.

If a Alternative input is defined, a connection is first established to the Alternative input. Only if this attempt fails as well, the next waiting period is used, and then again to the main destination.

The following diagram shows the behavior:



To safely monitor the connection, for leased line it is recommended in any case to use Keep Alive monitoring packets (**AT**KEEP**).

Delete:	**AT**LL<index>=** After "**=**", the input line is completed with **<CR>**.
Default:	0

ATLLWAIT**	**Incrementation of the waiting period between leased line dial-up attempts**		
Read:	**AT**LLWAIT?** Response: **LLWAIT: XXX,Y (ZZZ)** The number in brackets specifies the already counted unsuccessful dial-up attempts at the moment.		
Write:	**AT**LLWAIT=<factor>[,<mode>]** Parameters:		
	<factor>	**0** … **255**	Factor for specifying the time between the dial-up attempts to time = **<factor>** * 4^n [s] n = number of previous dial-up attempts
	<mode>	**0**	The incrementation is disabled, i.e. the time is always **<factor>** * 4 [s], regardless of the number of dial-up attempts.
		1	The incrementation increases the time between dial-up attempts with each dial-up attempt.
Delete:	The entry line is finished behind the „=“ sign with a <CR>. **AT**LLWAIT=<cr>**		
Default:	**AT**LLWAIT=5,1**		

ATLLWAITRST**	Number of failed connection attempts in leased line mode up to the restart
Read:	**AT**LLWAITRST?** Response: **LLWAITRST: XXX,Y (YYY)** The number in brackets shows the currently counted failed connection attempts.
Write:	**AT**LLWAITRST=<n>[,<mode>]** Parameters: **<n>** **0** … **255** Number of repeated attempts **<mode>** **0** Disconnect connection each time completely (incl. GPRS/EDGE) and perform a restart of the device when reaching **<n>** attempts. **1** Connection is only disconnected on the TCP side (like TCP listen or IPT redirect).
Delete:	After "=", the input line is completed with **<CR>**. **AT**LLWAITRST=<cr>**
Default:	**AT**LLWAITRST=255,0**

ATLOGOUT**	Timer-controlled logout/login
Read:	**AT**LOGOUT?** Response: **LOGOUT: <interval>,<mode> (<time_remaining>)** **OK** if the function is deactivated, “inactive” appears Parameters: **<interval>** See write command **<mode>** See write command **<time_remaining>** Remaining time in hours until the next logout/reset
Write:	**AT**LOGOUT=<intervall>[,<mode>]** Parameters: **<interval>** **0** Function deactivated **1 ... 99** Logout interval in hours after device start; **<mode>** 0 1 minute after it logged out from the GSM network, the INSYS GPRS 5.0 serial will automatically log back in. The timer is reset and restarts. If a data connection (CSD or GPRS or “TCP transparent”) is established at the time of the logout, the logout will wait until the connection is terminated. An existing PPP connection for operating mode TCP Listen is terminated the same way. **1** After the timer has expired, the device will perform a reset (restart); If at the time of the reset a data connection was established (CSD or GPRS or "TCP transparent"), the reset will not be performed until the connection has been terminated. An existing PPP connection for operating mode TCP Listen is terminated the same way. **2** After the timer has expired, the device will perform a forced reset (restart); the reset is performed in any case, regardless of currently active connections. **Note: If the parameter <mode> is not specified, <mode> = 0 is assumed.**
Default:	**AT**LOGOUT=0,0**

ATOUT**	Set the switch outputs
Read:	**AT**OUT?** Response: **OUT1: <status>** **OUT2: <status>** **OK**
Write:	**AT**OUT<output>=<status>** Parameters: **<output>** Switch output, for which the setting shall be valid. **1** Switch output 1 (UA1 - OUT1) **2** Switch output 2 (UA2 – OUT2) If **<output>** is not specified, the switch output OUT1 is used. **<status>** **0** Switch output on LOW **1** Switch output on HIGH **Note:** If the switch output settings must be restored after a restart, they must be saved with **AT**SAVE** .
Default:	**AT**OUT1=0** **AT**OUT2=0**

ATPASSC**	Configuration password
Read:	**AT**PASS?** Response: **PASSC: <status>** **OK** Parameters: **<status>** **active** Password stored **inactive** No password stored
Write:	**AT**PASSC=[<oldPW>][[,]<newPW>,<newPW>]** Response for input failure or if password incorrect: **ERROR** **<oldPW>** Old password; leave this space empty if no password is active **<newPW>** New password (enter twice for confirmation) The passwords must be separated with commas but without additional spaces. The maximum password length is 16 characters.
Delete:	**AT**PASSC=<altesPW>** If the input line is closed with **<CR>** after **<oldPW>**, the entry will be deleted.
Default:	No passwords assigned
Example:	Example: Input of a new password for the configuration. Currently no password is stored: **AT**PASSC=<newPW>,<newPW>** The new password is: “test”: **AT**PASSC=test,test**

ATPIN**	SIM card PIN
Read:	**AT**PIN?** Response: **PIN: <status>** **OK** Parameters: **<status>** **active** PIN stored **inactive** no PIN stored
Write:	**AT**PIN=<pin>** Parameters: **<pin>** Four digit number with the PIN of the inserted SIM card. The setting will only be accepted after the device has been reset. Attention: Before inserting a new SIM card you have to ensure that the correct PIN is stored. The PIN may need to be deleted. Otherwise the INSYS GPRS 5.0 serial attempts to login with a wrong PIN, which results in a locked PIN if the attempt is repeated.
Delete:	**AT**PIN=** After "**=**", the input line is completed with **<CR>**.
Default:	No PIN stored

ATPPPAUTH**	PPP authentication type for integrated TCP/IP stack
Read:	**AT**PPPAUTH?** Response: **PPPAUTH: <auth>** **OK**
Write:	**AT**PPPAUTH=<auth>** Parameters: **<auth>:** 0 no authentication type 1 PAP **Note: If an authentication type has been defined, use** ➢ **AT**PPPUSER=<user> to transfer the user name** ➢ **AT**PPPPW=<password> to transfer the password for the user name.** For the dial-up via GPRS, entering the user name and password is just a "formality". Actually ensuring the authentication takes place via the SIM card during the login into the GSM network. Therefore GPRS network providers provide just general information regarding if and how the user name and the password should be used. The GPRS network providers provide no information regarding the authentication type as the actual PPP authentication takes place only within the INSYS GPRS 5.0 serial. Only after the negotiation has taken place will the user name and the password be transferred to the network provider via GPRS protocol elements. In this case, the usage of PAP as authentication type is recommended. When dialling in via GSM, the user names and passwords defined in the ISP license agreement must be used to be able to work with the agreed ISP rate. If non-registered user names and passwords are specified, usually the highest rate is used for the online connection. Please refer to your ISPs documents regarding the authentication type; in general, it will be PAP (**AT**PPPAUTH=1**).
Delete:	**AT**PPPAUTH=** After "**=**", the input line is completed with **<CR>**.
Default:	0

ATPPPPW**	**PPP password for integrated TCP/IP stack**
Read:	**AT**PPPPW?** Response: **PPPPW: <pw>** **OK**
Write:	**AT**PPPPW=<pw>** Parameters: **<pw>:** **PPP password; maximum length 16 characters.**
Delete:	**AT**PPPPW=** After "**=**", the input line is completed with **<CR>**.
Default:	Empty
ATPPPUSER**	**PPP user name for integrated TCP/IP stack**
Read:	**AT**PPPUSER?** Response: **PPPUSER: <user>** **OK**
Write:	**AT**PPPUSER=<user>** Parameters: **<user>:** PPP user name; maximum length 38 characters.
Delete:	**AT**PPPUSER=** After "**=**", the input line is completed with **<CR>**.
Default:	Empty

ATPPPIPCHECK**	**PPP connection check for operating mode TCP Listen**
Read:	**AT**IPCHECK?** Response: **PPPIPCHECK: <timeout>** **OK**
Execute:	**AT**PPPIPCHECK** Response: **OK** After the **OK**, after a few seconds the status message of the PPP connection appears as non-synchronized event code: **+PPP-IP OK** The connection was successfully tested; the connection to the GPRS network is ok. **+PPP-IP RELEASE** The connection to the GPRS network is not ok; the PPP connection was terminated; the timers for reestablishing the connections are started with 20s. Response, if TPC Listen was not activated (AT**TCPLISTEN=0) or the PPP connection has not been established: **ERROR**
Write:	**AT**PPPIPCHECK=<timeout>** Parameters: **<timeout>:** Timeout in minutes (value range 0 ... 65535) for the automatic connection test of the PPP connection; after the timer has expired, the connection test is performed; the non-synchronized event codes are the same as for "Execute:".
Delete:	**AT**PPPIPCHECK=** After "**=**", the input line is completed with **<CR>**.
Default:	0

ATPROFILE**	Query of the INSYS AT command settings
Read:	**AT**PROFILE?** Response: **INSYS MICROELECTRONICS** **GPRS transparent** **SW-Version 02.100, 09.08.2007** **IMEI: 355633000398635** **IMSI: 262019010090915** **BAUD: 19200** **FORMAT: 8N1** **E: 1** **Q: 0** **V: 1** **\Q: 0** **&R: 1** **&C: 1** **&D: 2** **&S: 0** **S0: 0** **PIN: active** **SCN:** **PROVIDER: 0** **LOGOUT: 0,0 (0)** **GSMREQ: 60** **SMSRX: 1** **PASSC: inactive** **CLIP: inactive** **CLIP 1:** **CLIP 2:** **CLIP 3:** **DIALIN: 1** **DIALINNR:** **GPRSAPN:** **PPPAUTH: 0** **PPPUSER:** **PPPPW:**

Read: *(continuation)*	**VCOM: 1,0,1** **VCOMPORT: 0** **VCOMIP: 0.0.0.0** **VCOMURL:** **VCOMTIMEOUT: 10** **KEEP: 0** **TCPAGG: 100** **TCPBLOCK : 512** **CSDPRIO: 0** **TCPLISTEN: 0** **TCPLISTENPORT: 1234** **PPPIPCHECK: 0 (0)** **AUTOCSD:** **AUTOIP1: 0.0.0.0** **AUTOIP2: 0.0.0.0** **AUTOPORTIP1: 0** **AUTOPORTIP2: 0** **AUTOURL1:** **AUTOURL2:** **AUTOPORTURL1: 0** **AUTOPORTURL2: 0** **CALLBACK: 0,0,0** **LL1: 0** **LL2: 0** **INPUT1: 0** **INPUT2: 0** **INPUTTIMEOUT: 0** **INPUTCHANGE: 0** **OK** The settings are displayed in the same format as the query of an individual command. **Note: This command cannot be executed via SMS.**

ATPROVIDER**	**GSM network provider selection**
Read:	**AT**PROVIDER?** Response: **PROVIDER: <mode>[,<format>[,<oper>]]** **OK**
Write:	**AT**PROVIDER=<mode>[,<format>[,<oper>]]** Parameters: **<mode>** Empty: automatic operation; **<oper>** is ignored **0**: automatic operation; **<oper>** is ignored **1**: manual network provider selection; **<oper>** and **<format>** must be present; **2**: manual logout of the network **4**: automatic, manually pre-selected; if the manual login at provider **<oper>** fails, the automatic operation is used **<format>** **2**: numerical format for **<oper>:** (location identification number); 5-digit, unique identifier of a network provider **<oper>**: Network provider information **Note:** This command corresponds with the command **AT+COPS=** of the GSM/GPRS engine. It is managed as string by the µcontroller and is handed over to the GSM/GPRS engine for login when initializing the INSYS GPRS 5.0 serial. Benefit: **AT**PROVIDER** may also be configured remotely and via SMS to be able to make necessary changes on location. The maximum length of the parameter is 16 characters.
ATRESET**	Device reset
Write:	**AT**RESET** When entered correctly, the (INSYS GPRS 5.0 serial will perform a restart. After a reset, the previously stored values are re-loaded.
ATS0**	**Specifying the ring tones before automatic call acceptance**
Write:	**AT**S0=<n>** Automatic call acceptance after **<n>** ring tones. Value is immediately stored when entered, but becomes not effective before a restart.

ATSAVE**	**Save the extended INSYS settings**
Write:	**AT**SAVE** The extended INSYS settings will be saved in the non-volatile memory.
ATSCN**	SMS service center number
Read:	**AT**SCN?** Response: **SCN: <number>** **OK**
Write:	**AT**SCN=<number>** Parameters: **<number>** SMS service center number of the GSM provider. If no service center number has been specified, the number that is stored on the SIM card is used for sending SMS. The number should be stored in international format +49... to ensure the SMS dispatch when roaming (example Germany: +49...) . (max. 20 digits)
Delete:	**AT**SCN=** After "**=**", the input line is completed with **<CR>**.
Default:	Empty
ATSIGNAL**	GSM signal field strength
Read:	**AT**SIGNAL?** Response: **SIGNAL: <signal>** **OK** Parameters: **<signal>** value of the received GSM field strength **0** -113 dBm or less **1** -111 dBm **2..30** -109 dBm ... -53 dBm (2 dB – steps) **31** -51 dBm or better **99** Field strength can not be determined **Note: Antenna locations with values below 10 should be avoided.** **(see also AT**GSMREQ)**

ATSMSRX**	Automatic SMS reception processing
Read:	**AT**SMSRX?** Response: **SMSRX: <status>** **OK**
Write:	**AT**SMSRX=<status>** Parameters: **<status>** 0 Deactivated 1 Activated - Each incoming SMS is deleted after it has been processed. 2 Activated; SMS which are not intended for the INSYS GPRS 5.0 serial are left in the buffer General: Incoming SMS messages are optionally protected with the remote configuration password. **Note: see also AT**GSMREQ** To <**status**> 1: Each SMS is checked for validity (format, password, selective call acceptance). After processing, a response SMS is possibly sent, and the SMS is deleted from the storage location. If the SMS is not usable, it will be deleted from the SMS buffer immediately. The usage of the SMS reception by the user application is only possible in a restricted way. **Note: The application must query the SMS before automatic processing starts.** To <**status**> 2: The SMS which are not processed by the INSYS GPRS 5.0 serial stay in the buffer of the SIM card until they are retrieved by the application via the serial interface, and deleted. When the buffer of the SIM card is full, no further SMS messages will be accepted: The INSYS GPRS 5.0 serial edits and deletes the following SMS: a) All SMS messages with correct configuration password (when set), irrespective if the password is followed by a valid command or not. b) All SMS messages with correct syntax - starting with **AT**** - if no password is set. If the selective call acceptance is active and the phone number is invalid, the incoming SMS is stored in the buffer.
Default:	**AT**SMSRX=1**

ATTCPAGG**	**TCP block formation time of the integrated TCP/IP stacks**
Read:	**AT**TCPAGG?** Response: **TCPAGG: <agg-time>** **OK**
Write:	**AT**TCPAGG=<agg-time>** Parameters: **<agg-time>** 1...65535 To form TCP data packets in 1 ms units For IP-based transmission channels such as the "TCP transparent" connection, the transmitted amount of data consists not only of the sum of all user data of the application. They are rather packed into TCP/IP packets, which also generate network loads and therefore add to the total costs. Each TCP/IP message has a protocol overhead of 40 bytes. For each message there is also a confirmation message from the remote terminal with 40 bytes as well. It is important to select the suitable parameters for the application to form the TCP packets in the integrated TCP/IP stack; a data packet is sent to the remote terminal, if: ➢ The maximum size has been reached: See command **AT**TCPBLOCK** ➢ The maximum waiting time has expired: command **AT**TCPAGG**, adjustable in ms. The delay for the waiting time is restarted for every character incoming at the RS232 interface. When no more characters are received for the RS232 interface for the time set with **AT**TCPAGG**, a TCP packet is sent. Small values for **AT**TCPAGG** result in fast transmission of short packets, but also in a higher amount of data. Large values, however, result in small data packets being delayed. **Note: This parameter should be selected with care to avoid sending many small packets.**
Delete:	**AT**TCPAGG=** After "**=**", the input line is completed with **<CR>**.
Default:	100

ATTCPBLOCK**	**TCP block size of the integrated TCP/IP stack**
Read:	**AT**TCPBLOCK?** Response: **TCPBLOCK : <block-size>** **OK**
Write:	**AT**TCPBLOCK=<block-size>** Parameters: **<block-size>** 10...512 Number of bytes to form TCP data packets For IP-based transmission channels such as the "TCP transparent" connection, the transmitted amount of data consists not only of the sum of all user data of the application. They are rather packed into TCP/IP packets, which also generate network loads and therefore add to the total costs. Each TCP/IP message has a protocol overhead of 40 bytes. For each message there is also a confirmation message from the remote terminal with 40 bytes as well. It is important to select the suitable parameters for the application to form the TCP packets in the integrated TCP/IP stack; a data packet is sent to the remote terminal, if: ➢ The maximum size has been reached: Command **AT**TCPBLOCK** ➢ The maximum waiting time has expired: See command **AT**TCPAGG** To select smaller packet sized makes sense for lower data rates at the serial interface (e.g. 300 bps) to avoid possible timeouts of the application software. **Note: This parameter should be selected with care to avoid sending many small packets.**
Delete:	**AT**TCPBLOCK=** After "**=**", the input line is completed with **<CR>**.
Default:	512

ATTCPLISTEN**	**Operating mode TCP Listen**
Read:	**AT**TCPLISTEN?** Response: **TCPLISTEN: <mode>** **OK**
Write:	**AT**TCPLISTEN=<mode>** Parameters: **<mode>:** 0 TCP Listen deactivated 1 TCP Listen activated The first attempt to establish a PPP connection starts 20s after the device has been booted (DSR active) or 20s after activating the main input with **AT**TCPLISTEN=1**. The connection setup is monitored. If the connection setup fails (power failure, ...) the message "+PPP-IP RELEASE" appears and the device will automatically start reconnecting. During the connection setup, the control line OH is active. To save costs if there is a problem with the availability of services, the waiting time between the repeat attempts will grow for each subsequent attempt. ➢ 20 seconds after restart or if the last connection setup was successful ➢ 80 seconds after the first failure ➢ 320 seconds after the second failure ➢ 1280 seconds after the third failure ➢ 1 hour for each additional failure The command **AT**TCPLISTENWAITRST** may be used to limit the number of dialling attempts. If the PPP connection is established, the message "PPP-IP SETUP" appears and the control line OH is inactive again. The device has now received one IP address and can accept incoming TCP connections. As long as the PPP connection is established (TCP Listen is running), standard AT commands can only be used on a restricted basis. All standard AT commands (except **ATA**, **ATD**, **ATH**, **ATS0**, **AT+CSQ**, **AT+CPIN?**, **AT+CREG?**) are responded to with ERROR. Most of the Insys AT** commands, however, can be used. To securely monitor the PPP connection, we recommend the PPP connection test with **AT**PPPIPCHECK**.

Delete:	**AT**TCPLISTEN=** After "**=**", the input line is completed with **<CR>**.
Default:	0
ATTCPLISTENPORT**	**TCP data port for incoming TCP connections in the operating mode TCP Listen**
Read:	**AT**TCPLISTENPORT?** Response: **TCPLISTENPORT: <port>** **OK**
Write:	**AT**TCPLISTENPORT=<port>** Parameters: **<port>** TCP port which waits for incoming TCP connections. Values from 1...65535.
Delete:	**AT**TCPLISTENPORT=** After "**=**", the input line is completed with **<CR>**.
Default:	1234
ATTCPLISTENWAITRST**	Number of failed connection attempts in TCP Listen mode up to the restart
Read:	**AT**TCPLISTENWAITRST** Response: **TCPLISTENWAITRST: XXX (YYY)** The number in brackets specifies the already counted, failed connection attempts in TCP Listen mode, until the device is restarted.
Write:	**AT**TCPLISTENWAITRST=<n>** Parameters: **<n>** Number of repeated attempts 1 - 255
Delete:	After "**=**", the input line is completed with **<CR>**. **AT** TCPLISTENWAITRST =<cr>**
Default:	**255**

ATVCOM**	**Support of the INSYS virtual COM port driver**
Read:	**AT**VCOM?** Response: **VCOM: <auth_mode>,<dyn_ip_mode>,<auth_listen_mode>** **OK**
Write:	**AT**VCOM=<auth_mode>[,<dyn_ip_mode>[,<auth_listen_mode>]]** Parameters: **<auth_mode>** **0** No authentication when establishing an outgoing TCP connection **1** Sending a UDP packet for authentication when establishing an outgoing TCP connection. The UDP packet is send to the specified destination address and destination port for the TCP connection for ATD... The UDP packet has the following content: 0x59 0x45 0x43 0x24 0x15 0x02 **<imei>** <imei> is a string of 15 characters (not zero terminated). The server (remote terminal) may respond within two seconds with the following UDP packet to accelerate the connection setup: 0x59 0x45 0x43 0x24 0x06 0x2B After the two seconds have expired, the TCP connection will be established without receiving a response. **2** No UDP dispatch before the TCP connection was established; instead, immediately after the TCP connection was established, the IMEI (string with 15 characters, not zero terminated) is sent to the remote terminal. The remote terminal must send a response with a byte 0x2B (ASCII ‚+'), within the timeframe set with AT**VCOMTIMEOUT. As soon as the response arrives, the device will switch to the state CONNECT; if not response occurs, the connection is terminated.

Write: *(continuation)*	**<dyn_ip_mode>**	**0**	No dispatch of a UDP packet for communicating the new IP address, after the PPP connection in operating mode TCP Listen has been established.
		1	Dispatching a UDP packet to communicate the new IP address after the PPP connection in operating mode TCP Listen has been established. The UDP packet will be sent to the destination address and destination port specified at AT**VCOMIP and AT**VCOMPORT.
		2	Dispatching a UDP packet to communicate the new IP address after the PPP connection in operating mode TCP Listen has been established. The UDP packet will be sent to the destination address and destination port specified at **AT**VCOMURL** and **AT**VCOMPORT**. The UDP packet has the following content: 0x59 0x45 0x43 0x24 0x19 0x03
	<imei> <ip>		<imei> is a string of 15 characters, (not zero terminated). <ip> is the current IP address as 4 byte hex number (32 Bit). The server (remote terminal) can respond with the following UDP packet within two seconds: 0x59 0x45 0x43 0x24 0x06 0x2C; if there is no response, this will have no meaning.
	<auth_listen_mode>		
		0	No authentication by a UDP packet before accepting an incoming TCP connection in operating mode TCP Listen required.
		1	Authentication by a UDP packet before accepting an incoming TCP connection in operating mode TCP Listen required. The device waits at the port specified with **AT**TCPLISTENPORT** for a UDP packet to authenticate the remote terminal. The remote terminal must send a UDP packet with the following content: 0x59 0x45 0x43 0x24 0x06 0x01. The device responds with the following UDP packet: 0x59 0x45 0x43 0x24 0x06 0x2A. Only after the remote terminal has received a response from the module, can it establish the TCP connection. A time window of 10s exists. Outside of this time window, each incoming TCP connection request will be responded to with a TCP RST.
	Note:		**The activation is used to support the cooperation with the INSYS virtual COM port driver. For the driver description and the required settings, a special manual is available from INSYS MICROELECTRONICS GmbH.**

Delete:	AT**VCOM= After "**=**", the input line is completed with **<CR>**.
Default:	1,0,1
ATVCOMPORT**	**UDP destination IP address for the information about the IP address (DYN IP) for TCP Listen**
Read:	**AT**VCOMPORT?** Response: **VCOMPORT: <port>** **OK**
Write:	**AT**VCOMPORT=<port>** Parameters: **<port>** UDP-Port, to which the UDP packet will be sent to communicate the current IP address; values from 1...65535.
Delete:	**AT**VCOMPORT=** After "**=**", the input line is completed with **<CR>**.
Default:	0
ATVCOMIP**	UDP destination IP address for the information about the IP address (DYN IP) for TCP Listen
Read:	**AT**VCOMIP?** Response: **VCOMIP: <ip>** **OK**
Write:	**AT**VCOMIP=<ip>** Parameters: **<ip>** IP address to which the UDP packet is sent to communicate the current IP address.
Delete:	**AT**VCOMIP=** After "**=**", the input line is completed with **<CR>**.
Default:	0.0.0.0

ATVCOMURL**	UDP destination URL for the information about the IP address (DYN IP) for TCP Listen
Read:	**AT**VCOMURL?** Response: **VCOMURL: <domain>** **OK**
Write:	**AT**VCOMURL=<domain>** Parameters: **<domain>** Domain Name, to which the UDP packet is sent to communicate the current IP address; the maximum length is 30 characters.
Delete:	**AT**VCOMURL=** After "**=**", the input line is completed with **<CR>**.
Default:	Empty Empty

ATVCOMTIMEOUT**	Timeout for TCP variant for authentication at the virtual COM port
Read:	**AT**VCOMTIMEOUT?** Response: **VCOMTIMEOUT: <timeout>** **OK**
Write:	**AT**VCOMTIMEOUT=<timeout>** Parameters: **<timeout>** **1...255** Within this time frame (in seconds), the response from the remote terminal to the communication of the IMEI must have arrived for
Reset	**AT**VCOMTIMEOUT=** After "**=**", the input line is completed with **<CR>**.
Default:	10 (seconds)
ATVERSION**	Query of the software version
Read:	**AT**VERSION?** Response: **INSYS MICROELECTRONICS** **GPRS transparent** **SW-Version 02.100, 09.08.2007**

3.2 AT Commands

3.2.1 AT Commands According to V.25ter

Command	Description
ATA	Answer mode/manual call acceptance The INSYS GPRS 5.0 serial modem is switched into response mode. See also **ATS0**
AT&C<n>	Set function type of the control line DCD **AT&C0** DCD is always ON **AT&C1** DCD displays Connect (default)
AT&D<n>	Function type of the control line DTR Set (Switch ON→Off) **AT&D0** Ignored **AT&D1** Change to command mode, connection maintained **AT&D2** Change to command mode, connection terminated (default)
ATDL	Redial last CSD connection
ATD<n>	Establish connection / establish CSD connections Dialling the phone number **<n>** **Additional speed dialling:** **ATDAUTOCSD or ATDS1** Establishing a CSD connection to the phone number configured in **AT**AUTOCSD1**. In the operating mode TCP Listen, CSD numbers can not be dialled during a PPP connection**.** Establish “TCP transparent” connections **ATD<ip>:<port>** **Parameters:** **<ip>** IP address, to which the "TCP transparent” IP connection is established <port> TCP port, for which at the IP address <ip> the "TCP Transparent” IP connection is established. Values from 1...65553. **e.g. ATD213.7.0.46:1234**

Command	Description
	ATD"<domain>":<port> **Parameters:** **<domain>** Domain name to which the “TCP transparent" connection is established (maximum length 30 characters) <port> TCP port to which the “TCP transparent” connection is established. Values from 1...65535. **e.g. ATD"leitstelle.dydns.org":1222** **Additional speed dialling:** **ATDAUTOIP or ATDS=2** Establishing a “TCP transparent” IP connection to the destination defined in **AT**AUTOIP1 / AT**AUTOPORTIP1.** **ATDAUTOURL or ATDS=3** Establishing a “TCP transparent” connection to the destination domain and port defined in **AT**AUTOURL1 and AT**AUTOPORTURL1.** **ATDAUTOIP2 or ATDS=5** Establishing a “TCP transparent” IP connection to the destination defined in **AT**AUTOIP2 / AT**AUTOPORTIP2.** **ATDAUTOURL2 or ATDS=6** Establishing a “TCP transparent” connection to the destination domain and port defined in **AT**AUTOURL2 und AT**AUTOPORTURL2.** Connection setup via SMS CSD as well as “TCP transparent” connections may be established (also via speed dialling) via SMS. A connection which was active at the processing time is properly terminated; afterwards a connection requested via SMS is established. We recommend, however, terminating a currently active connection using **ATH** via SMS und then reestablishing a new connection with **ATD** via SMS. If a response is queried via SMS, an SMS with the content "**CONNECTING**" is returned at the moment a connection is established.
ATE<n>	Command entry Echo The INSYS GPRS 5.0 serial returns all entries at the serial interface. **ATE0** Switch off Echo **ATE1** Switch on Echo (default)

Command	Description
AT&F	**Load factory settings** *The factory settings are loaded. The factory settings are marked with "(default)".* Directly after that, for ➢ Normally 700 ms (at 19200 bps) ➢ 1000 ms at **AT**CLIP=1** no entry of **AT** commands is possible. **Note: The factory settings of the INSYS AT** commands are loaded with AT**DEFAULT. If this behaviour causes problems, this waiting time can, within reasonable limits, be reduced according to the application, using the command AT**CMDWAIT. More information on this topic is available on request from INSYS MICROELECTRONICS GmbH.**
ATH	Terminate connection. ➢ Terminate CSD connections ➢ Terminate voice connections **Note: No switching into command mode required** ➢ Terminate "TCP transparent" connections Starting with the proper termination of the TCP connection to the remote terminal, all activate protocol stacks are closed. The GPRS connection is terminated as well, e.g. after the connection was ended, the provider starts the calculation for the transmitted data volume, rounded to the next full billing unit. This is not the case if the connection is terminated in the operating mode TCP Listen. In this case, the GPRS session is maintained after the TCP connection is terminated. **Note: Before the connection can be terminated, switching to online command mode is required for data connections („+++" or DTR-Drop for AT&D1).**
ATI	Output of product information of the GSM/GPRS engine
ATO	Return to online data mode
ATQ<n>	Quiet control This command toggles sending messages to the PC on and off. **ATQ0** Send messages to application (default) **ATQ1** Don't send messages to application
AT\Q<n>	Data flow control of the serial interface **AT\Q0** Off (default) **AT\Q1** Software data flow control (XON/XOFF) **AT\Q3** Hardware handshake (RTS/CTS) **Note: A short pause in command acceptance of approx. 800 ms takes place after executing this command.**

Command	Description
ATS0=<n>	Automatic call acceptance **<n>** **0** Function inactive **1...n** Ring tones until automatic call acceptance occurs (value 1 is only possible for TCP connections) **Note: In contrast to earlier versions, setting the ring tones until the call acceptance (S0 registry) with the command ATS0=<n> can only be performed after a valid PIN was entered.**
AT&S<n>	Sets function type of the control line DSR **AT&S0** DSR always ON (default) **AT&S1** DSR follows DCD
ATV<n>	Format of modem messages This command determines if the modem transmits messages to the application in short or long format. **ATV0** Messages only in short format, i.e. only the error number **ATV1** Messages in long format, e.g. the error text (default)
AT&V	Display configurations This command results in the display the **AT** commands (V.25ter)in the active. **Note: The settings for ATE, ATQ, ATV, AT\Q, AT&C, AT&D, AT&S, ATS0 , AT+IFC will not match the actual values for AT&V.** **The settings of the actual values and all INSYS AT** commands are displayed with AT**PROFILE.**
AT&W	Save configuration The command saves the current modem configuration. **Note: The INSYS AT** command settings are saved with AT**SAVE.**
ATX<n>	CONNECT response format and connection monitoring **<n>** **0** Numerical response for **CONNECT**, no dial tone detection, no busy detection **1** Text response for **CONNECT**, no dial tone detection, no busy detection **2** Text response for **CONNECT**, dial tone detection, no busy detection **3** Text response for **CONNECT**, no dial tone detection, busy detection **4** Text response for **CONNECT**, dial tone detection, busy detection

Command	Description
ATZ	Software reset/load default All current parameters - not INSYS **AT****commands - are reset to the values saved in the user profile. Directly after that, for ➢ Normally 700 ms (at 19200 bps) ➢ 1000 ms at **AT**CLIP=1** no entry of **AT** commands is possible. If this behavior causes problems, this waiting time can, within reasonable limits, be reduced according to the application, using the command AT**CMDWAIT. More information on this topic is available on request from INSYS MICROELECTRONICS GmbH. **Note: The INSYS AT**commands are reloaded after each restart (e.g. after the command AT**RESET).**
<Pause> +++ <Pause>	Change from data mode to command mode (online command mode). 1 second pause before and after the entry, no **<CR>**. Response "**OK**"
<Pause> ** <Pause>**	Remote configuration After the 4 escape characters were entered at the local device (1 second pause before and after the entry, no return - **<CR>** -), the remote configuration at the remote terminal is activated. The data connection is maintained in the background. The 4 escape characters must be entered within 1 second. Response "**OK**" **Note: See also Chapter 2.1 – "Short description of the AT commands". The remote configuration mode is ended with AT**EXIT.**

3.2.2 AT Commands for GSM Connection

Command	Description
AT+CBST?	Queries the transmission service type
AT+CBST=<n>	Sets transmission service type to modem and ISDN TA **<n>** **0** auto bauding **1** 300 bps (V.21) - analogue **2** 1,200 bps (V.22) - analogue **4** 2,400 bps (V.22bis) - analogue **6** 4,800 bps (V.32) - analogue **7** 9,600 bps (V.32) – analogue - (default) **14** 14,400 bps (V.34) - analogue **65** 300 bps (V.110) - ISDN **66** 1,200 bps (V.110) - ISDN **68** 2,400 bps (V.110) - ISDN **70** 4,800 bps (V.110) - ISDN **71** 9,600 bps (V.110) - ISDN **75** 14,400 bps (V.110) - ISDN
AT+COPS?	Display selected network provider
AT+COPS=<mode>[,<format>,<oper>]	Select network provider and login Parameters: **<mode>** Empty automatic operation; **<oper>** is ignored **0** automatic operation; **<oper>** is ignored **1** Manual network provider selection; **<oper>** and **<format>** must be present; **2** manual logout of the network **4** automatic, manually pre-selected; if the manual login at the provider **<oper>** fails, automatic operation is used **<format>** **2** Numerical information for **<oper>** **<oper>** Network provider information (see Chapt. 5 – "Network Provider Identification Numbers") **Note: See also AT**PROVIDER.**

Command	Description
AT+CPIN?	Query required password Response (example): **READY** No input required **SIM PIN** Enter SIM card PIN **SIM PUK** Enter PUK of the SIM card (after repeated false entry of the PIN)
AT+CPIN=<n>	Enter SIM card PIN **<n>** 4 digit number After the PIN was entered, the INSYS GPRS 5.0 serial must be logged in with **AT+COPS=<n> [,<format>,<oper>]**. After repeated false entries the PUK must be typed in. To type in the PUK use the following command: **AT+CPIN=<PUK>,<new PIN>** The PIN is permanently stored in the controller with the extended command **AT**PIN.**
AT+CREG?	Display registration state (network state) Response: **<n>**,**<stat>** Parameters: **<stat>** **0** Not registered, no GSM network search **1** Registered at standard provider **2** Not registered, GSM network search **3** Rejected **5** Registered, roaming
AT+CSQ	Display signal quality (intensity of the GSM signal) Response: **<rssi>**,**<ber>** Parameters: **<rssi>** value of the received GSM field strength **0..10** Poor signal, change location **11..31** Good signal **99** Not detectable **Note: Antenna locations with values below 10 should be avoided. See also AT**SIGNAL.** **<ber>** Bit error rate The bit error rate is only measured during an existing connection. Otherwise the values 0 or 99 are returned.

3.2.3 AT commands for SMS

Command	Description
AT+CMGD=<n>	Delete SMS message **<n>**
AT+CMGF?	Query SMS message format
AT+CMGF=<n>	Set SMS message format **<n>** **0** PDU mode – (default) **1** Text mode
AT+CMGL=<stat>	List SMS messages in selected memory **PDU mode** **<n>** **0** Unread messages **1** Read messages **2** Saved, sent messages **3** Saved, unread messages **4** All messages **Text mode** **<n>** **REC UNREAD** Unread messages **REC READ** Read messages **STO SENT** Saved, sent messages **STO UNSENT** Saved, unread messages **ALL** All messages **Note: The status of unread messages is set to read.**
AT+CMGR=<n>	Read SMS message **<n>** **Note: The status of unread messages is set to read.**
AT+CMGS=<nr> **<CR><text>** **<Ctrl-Z>**	Send SMS message (text mode) **<no>** Phone number **<CR>** Enter/return key **<text>** SMS message text **<Ctrl-Z>** Press Ctrl key and Z (0x1A) The phone number is completed with **<CR>**, the actual text with **<Ctrl-Z>**. **Note: The SMS message format must be changed to AT+CMGF=1 beforehand.**

Command	Description
AT+CPMS?	Query preferred SMS storage locations Response: **+CPMS: <mem1>,<used1>,<total1>,<mem2>,<used2>,<total2>, <mem3>,<used3>,<total3>** Parameters: **<mem1/2/3>** See **AT+CPMS=<mem1>[,<mem2>[,<mem3>]]** **<used1/2/3>** Storage locations already occupied with SMS in the accord-ing memory. **<total1/2/3>** Maximum size of the according memory
AT+CPMS=<mem1>[,<mem2>[,<mem3>]]	Set preferred SMS storage locations **<mem1>** Memory that is used when SMS are displayed, read, and deleted. **<mem2>** Memory that is used when SMS are sent or saved. **<mem3>** Memory that is used when SMS are received. For all 3 storage locations, the following entries are available as parameters: **SM:** SMS memory on SIM card (memory space depends on the SIM Card **ME:** SMS memory on the GSM/GPRS engine (25 storage locations) **MT:** The sum of **SM** + **ME** **Note: It is recommended to use the combined memory "MT" for all 3 storage locations (AT+CPMS=MT,MT,MT)**
AT+CSCA?	Query the number of the SMS service center
AT+CSCA=<nr>	Set number of the SMS service center **<no>** Number in international format +49... Germany ++49...)
AT^SMGL	List SMS messages from preferred memory (without changing the status)
AT^SMGO?	Query display SMS overflow Response: **^SMGO: <n>,<mode>**

Command	Description
AT^SMGO=<n>	Set display SMS overflow **<n>** **0** inactive (default) **1** active – change of **<mode>** is displayed Parameters: **<mode>** **0** memory available **1** memory full **2** memory full, message waiting
AT^SMGR=<n>	Read SMS message <n> (without changing the status)

3.2.4 AT commands for GPRS

Command	Description
AT+CGATT?	Display GPRS registration state (attach and detach)
AT+CGATT=<state>	GPRS registration (attach and detach) Parameters: **<state>** **0** Detach(ed)- not registered (default) **1** Attach(ed) - registered
AT+CGACT?	PDP context state (active or inactive)
AT+CGACT=[<state>[,<cid>[,<cid>[,...]]]]	Activate/deactivate PDP context Parameters: **<state>** **0** PDP context indicated with <cid> deactivated (default) **1** PDP context indicated with **<cid>** activated **<cid>** Index of a defined PDP context (see **AT+CGDCONT**) which is activated/deactivated apply.
AT+CGDATA=[<L2P>[,<cid>[,<cid>[,...]]]]	Start GPRS connection Parameters: **<L2P>** Layer 2 protocol between application and GPRS engine. **1** PPP **<cid>** Index of a defined PDP context (see **AT+CGDCONT**) which will be activated/ deactivated . If the command can be successfully executed, the data mode will be active with the message "**CONNECT**" and the control line DCD. To maintain a modem-compatible connection setup, a GPRS connection setup may also be performed with the command **ATD**.
AT+CGDCONT?	Read PDP context

Command	Description
AT+CGDCONT=[<cid> [,<PDP_type> [,<APN> [,<PDP_addr>]]]]	Define PDP context Parameters: **<cid>** Index which defines the according PDP context in connection with other AT commands that use the PDP context. **1** PDP context 1 **2** PDP context 2 **<PDP_type>** Packet transmission protocol type **IP** Internet Protocol **<APN>** Access point name as character string. Must be written in quotation marks. **<PDP_addr>** String that indicates with which address the GPRS end device can be identified (IP V4 Adresse at PDP_type IP). If the value is omitted, the application can enter it during the PDP start procedure or a dynamic IP address is requested. **Note: Entering AT&F or ATZ will set all inactive contexts to undefined. The setting is not stored with AT&W.**
AT+CGPADDR=[<cid>, [<cid>[,...]]]	Display PDP address Displays **<PDP_addr>** defined with **AT+CGDCONT** of the PDP context indicated with **<cid>.** **Note: The setting is not stored with AT&W.**
AT+CGREG?	Query GPRS network registration state
AT+CGREG=<n>	Set display of the GPRS network registration state Parameters: **<n>** Non-synchronized event codes for GPRS network registration state **0** No non-synchronized event codes **1** Display non-synchronized event codes (only for registration state modifications) When querying with **AT+CGREG?** or for activated non-synchronized event codes **<n>=1** the following parameters are displayed: **<n>** see above **<stat>** GPRS network registration state **0** Not registered, GPRS end device is attempting attempting to register. **1** Registered in home network **2** Not registered, GPRS end device is attempting to register. **3** Registration not permitted by provider. **4** Unknown **5** Registered via roaming **Note: The setting is not stored with AT&W.**

Command	Description
AT+CGSMS=<n>	Set transmission path for outgoing SMS
AT^SGACT?	Display states of active PDP contexts
AT^SGAUTH?	Display PPP authentication method
AT^SGAUTH=<auth>	Set PPP authentication method Parameters: **<auth>** 0 No authentication 1 PAP **Note: The setting is not stored with AT&W.**
ATD*99*<cid>#**	Modem-compatible GPRS connection setup **<cid>** Index of a defined PDP context (see **AT+CGDCONT**) which is used for the GPRS connection setup. **Note: This connection type is not transparent! In this case, the TCP/PPP stack must be provided by an application.**
ATH	Modem-compatible GPRS connection termination **Note: Switching to online command mode ("+++" or DTR drop at AT&D1) is required beforehand.** **As an alternative, the switching to the online command mode can also be performed by pressing the Reset key twice for a short time.**

4 GSM Character Set for SMS

The internal GSM character set GSM 03.38 does not match the usual ASCII character set of PCs in all positions. Therefore, the following restrictions must be observed for SMS texts.

When entering data via the masks of the configuration software HSComm:

- Permitted text characters in SMS messages are only letters (without umlauts), digits, punctuation marks, brackets, underscore, % & *.
- 8-bit characters (e.g. umlauts) and the characters $ @ { } [ ] ^ ° ` ´ are not supported.
- The character @ of an e-mail address must be replaced by an asterisk *.

For direct entry into a terminal program the following applies:

- The underscore must be replaced by the character number 11h (hexadecimal).
- The character 00h (hexadecimal) may not be used in any case.

5 Network Provider Identification Numbers

Identifiers and names of the network providers (GSM Location Area Identification Number) for the GSM module, in alphabetic order:

41802	2
23430	30
23431	31
23432	32
310150	150
310170	170
310410	410
45703	45703
27202	02 - IRL
23210	3 AT
23806	3 DK
45403	3 HK
22299	3 ITA
24002	3 SE
23420	3 UK
45404	3(2G)
50506	3TELSTRA
62801	628 01/LIBERTIS
23207	A tele.ring
23201	A1
46668	ACeS
51000	ACeS
51511	ACeS
52020	ACeS
41201	AF AWCC
40402	AirTel
40403	AirTel
40410	AirTel
40431	AirTel
40445	AirTel
40449	AirTel
40490	AirTel
40492	AirTel
40493	AirTel
40494	AirTel
40495	AirTel
40496	AirTel
40497	AirTel
40498	AirTel
41501	alfa
60301	ALG Mobilis
42001	ALJAWAL
79502	Altyn Asyr
72424	AMAZONIA
41902	KT MTCNet
41903	KT WATANIYA
40102	KZ KCELL
40101	KZ K-MOBILE
27001	L LUXGSM
27077	L TANGO
27099	L VOX.LU
61801	LBR Lonestar Cell
29577	LI TANGO
61802	LIBERCELL
60600	LIBYANA
51008	LIPPO TEL
65102	LS-ECONET-EZI-CEL
24602	LT BITE GSM
24701	LV LMT GSM, LV LMT
24702	LV TELE2
45501	MAC-CTMGSM
28202	MAGTI-GSM-GEO
61001	MALITEL ML
23458	Manx Pronto
90112	MCP Maritime Com
25902	MD MOLDCELL
25901	MD VOXTEL
25002	MegaFon RUS
70801	Megatel GSM
64602	MG ANTARIS
64601	MG Madacom
61902	MILLICOM SL
29402	MKD COSMOFON
29401	MKD-MOBIMAK
41401	MM 900
42899	MN MobiCom
21805	MOBI'S
29341	MOBITEL
41301	Mobitel
45601	MOBITEL-KHM
64002	MOBITEL - TZ
63401	MobiTel SDN
22004	MONET
60401	MOR IAM
60400	MOR MEDITEL
21407	movistar
70403	MoviStar
70604	MoviStar
64501	ZM CELTEL
64804	ZW ECONET
64801	ZW NET*ONE
61801	LBR Lonestar Cell
29577	LI TANGO
61802	LIBERCELL
60600	LIBYANA
51008	LIPPO TEL
65102	LS-ECONET-EZI-CEL
24602	LT BITE GSM
24701	LV LMT GSM, LV LMT
24702	LV TELE2
45501	MAC-CTMGSM
28202	MAGTI-GSM-GEO
61001	MALITEL ML
23458	Manx Pronto
90112	MCP Maritime Com
25902	MD MOLDCELL
25901	MD VOXTEL
25002	MegaFon RUS
70801	Megatel GSM
64602	MG ANTARIS
64601	MG Madacom
61902	MILLICOM SL
29402	MKD COSMOFON
29401	MKD-MOBIMAK
41401	MM 900
42899	MN MobiCom
21805	MOBI'S
29341	MOBITEL
41301	Mobitel
45601	MOBITEL-KHM
64002	MOBITEL - TZ
63401	MobiTel SDN
22004	MONET
60401	MOR IAM
60400	MOR MEDITEL
21407	movistar
70403	MoviStar
70604	MoviStar
64301	MOZ-mCel
60901	MR MATTEL
64901	MTC NAMIBIA
42602	MTC VODAFONE BH

27601	AMC-AL
34008	AMIGO
362951	ANT
36269	ANT CURACAO TELECOM GSM
34430	APUA PCS ANTIGUA
72234	AR PERSONAL
28010	areeba
41702	areeba
63402	areeba SDN
722310	ARG CTI Movil
41800	ASIACELL
41805	ASIACELL
41820	Atheer Iraq
28603	AVEA
40001	AZE-AZERCELL GSM
20610	B mobistar
43604	Babilon-M
21803	BA-ERONET
40002	BAKCELL GSM 2000
47003	Banglalink
20620	BASE
36439	BaTelCell
42601	BATELCO
25028	Bee Line
25099	Bee Line
20601	BEL PROXIMUS
61604	BELL BENIN COMMUNICATION
61302	BF Celtel
28405	BG GLOBUL
47002	BGD AKTEL
47004	BGD bMobile
47001	BGD-GP
21890	BH GSMBIH
43701	BITEL KGZ
61603	BJ BENINCELL
73602	BOMOV
34020	BOUYGTEL-C
40421	BPL MOBILE
40427	BPL MOBILE
40443	BPL MOBILE
40446	BPL MOBILE
72416	BRA BrTCelular
72415	BRA SCTL
52811	BRU-DSTCom
40211	BT B-Mobile
35002	BTC MOBILITY LTD.
70267	BTL
64202	BUSAFA
64301	MOZ-mCel
60901	MR MATTEL
64901	MTC NAMIBIA
42602	MTC VODAFONE BH
28401	M-TEL GSM BG
62130	MTN - NG
62401	MTN CAM
65510	MTN-SA
64110	MTN-UGANDA
25702	MTS BY
25001	MTS-RUS
47201	MV DHIMOBILE
65001	MW CP 900
33403	MX MOVISTAR GSM
33420	Mx Telcel GSM
50219	MY CELCOM
50213	MY CELCOM 3G
50212	MY MAXIS
24202	N NetCom GSM
24201	N Telenor
42203	NAWRAS
54601	NCL MOBILIS
61403	NE TELECEL
62140	NG Mtel
20408	NL KPN
20412	NL Telfort
26207	o2 - de
26208	o2 - de
23410	O2 - UK
27402	Og Vodafone
27403	Og Vodafone
72431	Oi
732111	OLA
42202	OMAN MOBILE
24601	OMNITEL LT
23205	one
23433	Orange
23830	Orange
37001	Orange
40420	Orange
65202	Orange
62402	Orange CAM
22803	orange CH
61203	Orange CI
20801	Orange F
29502	Orange FL
20420	Orange NL
64700	Orange re
23101	Orange SK
52099	Orange Th
25011	ORENSOT
23003	OSKAR

65201	BW MASCOM
25701	BY VELCOM
338180	C&W
342600	C&W
344920	C&W
346140	C&W
352110	C&W
354860	C&W
356110	C&W
358110	C&W
360110	C&W
365840	C&W
366110	C&W
376350	C&W
23455	Cable & Wireless Guernsey
45618	CAMBODIA SHI-NAWATRA
302720	CAN Rogers Wire-less Inc.
348570	CCT Boatphone
63089	CD OASIS
61803	Celcom GSM
65507	Cell C
311130	Cell One Amarillo
310450	Cell One of NE Colorado
40434	CellOne
40438	CellOne
40451	CellOne
40453	CellOne
40454	CellOne
40455	CellOne
40457	CellOne
40458	CellOne
40459	CellOne
40462	CellOne
40464	CellOne
40466	CellOne
40471	CellOne
40472	CellOne
40473	CellOne
40474	CellOne
40475	CellOne
40476	CellOne
40477	CellOne
40479	CellOne
40480	CellOne
40481	CellOne
61701	CELLPLUS-MRU
310560	Cellular One DCS
61402	CELTEL
62901	CELTEL
23101	Orange SK
52099	Orange Th
25011	ORENSOT
23003	OSKAR
26803	P OPTIMUS
26806	P TMN
41004	PAK - PL
71401	PANCW
70401	PCS
311170	PetroCom
51505	PH Sun Cellular
31180	Pine Cellular
41001	PK MK
41003	PK-UFONE
26001	Plus GSM
53701	PNGBMobile
74001	PORTA GSM
25092	Primetelefone RUS
22002	ProMonte
74402	PRY Porthable
310500	PSC Wireless
74405	PY Personal
42701	QAT QATARNET
28301	RA-ARMGSM
63510	R-CELL
25012	RF FAR EAST
41503	RL MTC Lebanon
22601	RO CONNEX
22603	RO Cosmorom
22610	RO ORANGE
41220	ROSHAN
25007	RUS 07, RUS SMARTS
25017	RUS 17
25010	RUS DTC
25013	RUS Kuban-GSM
25044	RUS North Caucasian GSM
25019	RUS_BASHCELL
25015	RUS15, RUS SMARTS
25016	RUS16,250 16
24007	S COMVIQ
42101	SabaFon
63902	Safaricom
61401	SAHELCOM
41808	SanaTel
25005	SCS RUS
71073	SERCOM
36301	SETAR GSM
63301	SEYCEL
63310	SEZ AIRTEL
26803	P OPTIMUS
26806	P TMN
41004	PAK - PL
71401	PANCW
70401	PCS
311170	PetroCom
51505	PH Sun Cellular
31180	Pine Cellular
41001	PK MK
41003	PK-UFONE
26001	Plus GSM
53701	PNGBMobile
74001	PORTA GSM
25092	Primetelefone RUS
22002	ProMonte
74402	PRY Porthable
310500	PSC Wireless
74405	PY Personal
42701	QAT QATARNET
28301	RA-ARMGSM
63510	R-CELL
25012	RF FAR EAST
41503	RL MTC Lebanon
22601	RO CONNEX
22603	RO Cosmorom
22610	RO ORANGE
41220	ROSHAN
25007	RUS 07, RUS SMARTS
25017	RUS 17
25010	RUS DTC
25013	RUS Kuban-GSM
25044	RUS North Caucasian GSM
25019	RUS_BASHCELL
25015	RUS15, RUS SMARTS
25016	RUS16,250 16
24007	S COMVIQ
42101	SabaFon
63902	Safaricom
61401	SAHELCOM
41808	SanaTel
25005	SCS RUS
71073	SERCOM
36301	SETAR GSM
63301	SEYCEL
63310	SEZ AIRTEL
64710	SFR REUNION
52503	SGP-M1-3GSM
29370	SI VEGA 070
29340	SI vodafone

63903	CELTEL
64005	celtel
63002	CELTEL DRC
62803	CELTEL GA
65010	CELTEL MW
61901	CELTEL SL
62201	CELTEL TCD
70802	CELTELHND
31030	Centennial Communications
46000	CHINA MOBILE
46001	CHN-CUGSM
46692	Chunghwa
310380	Cingular
342810	Cingular
344930	Cingular
35010	Cingular
35230	Cingular
35830	Cingular
36010	Cingular
36620	Cingular
54801	CK KOKANET
73001	CL ENTEL PCS
73010	CL ENTEL PCS
72405	Claro
62910	COG LIBERTIS
732101	COLOMBIA - COMCEL S.A
70402	Comcel_GSM
62501	CPV MOVEL
72432	CTBC CEL
72433	CTBC CEL
72434	CTBC CEL
36801	CU/C_COM
28001	CY CYTAGSM
25014	Di-ex
50216	DiGi
33805	DIGICEL
342750	DIGICEL
35250	Digicel
35850	DIGICEL
36070	DIGICEL
70602	Digicel
310940	Digital Cellular
73402	DIGITEL TIM
63801	DJ EVATIS
60302	Djezzy
23802	DK SONOFON
60303	DZA-NEDJMA
21403	E AMENA
31090	Edge Wireless
24802	EE elisa
24801	EE EMT GSM
64710	SFR REUNION
52503	SGP-M1-3GSM
29370	SI VEGA 070
29340	SI vodafone
25004	SIBCHALLENGE RUS
52501	SingTel
52502	SingTel-G18
51503	SMART
45406	SmarTone
45500	SmarTone
45415	SmarTone 3G
60801	SN ALIZE
60802	SN-SENTEL SG
63704	SOMAFONE
43601	Somoncom
63701	SOMTELESOM
42102	SPACETEL
64201	Spacetel Bl
30801	SPM AMERIS
24010	SpringMobil SE
74602	SR.TELESUR.GSM
41303	SRI-CELLTEL
41302	SRI DIALOG
21303	STA-MOBILAND
52505	STARHUB
62601	STP CSTmovel
45419	SUNDAY
22802	Sunrise
65310	Swazi-MTN
24004	SWEDEN
24005	Sweden 3G
22801	Swisscom
29501	SwisscomFL
41709	SYR MOBILE SYR
41701	SYRIATEL
46689	T3G
45708	TANGO LAO
23801	TDC MOBIL
36251	Telcell GSM
29001	TELE Greenland
24603	TELE2
24803	TELE2
25020	TELE2
61602	TELECEL BENIN
74404	Telecel GSM
64502	TELECEL ZM
64803	TELECEL ZW
64282	TELECEL-BDI
61205	TELECEL-CI
73002	TELEFONICA
310740	TELEMETRIX
72423	TELEMIG CEL
70603	TELEMOVIL
41006	Telenor PK
23820	TELIA DK

60201	EGY MobiNiL
61710	EMTEL-MRU
311160	EMW
26203	E-Plus
26002	Era
70601	ESV PERSONAL
63601	ETH-MTN
42003	Etihad Etisalat
45702	ETL MOBILE NET-WORK
23002	EUROTEL - CZ
20820	F - BOUYGUES TELECOM
20810	F SFR
46601	Far EasTone
311210	FARMERS
41601	Fastlink
24414	FI AMT
24491	FI SONERA
302370	Fido
24403	FINNET
24412	FINNET
54201	FJ VODAFONE
24405	FL elisa
29505	FL1
34001	F-Orange
34002	FR
55001	FSM Telecom
54720	F-VINI
28801	F□oya Tele
62802	GAB TELECEL
60701	GAMCEL
28201	GEO-GEOCELL
62002	GH ONEtouch
62001	GH SPACEFON
62003	GH-MOBITEL
26601	GIBTEL GSM
62150	Glo NG
51502	Globe Telecom-PH
61102	GN LAGUI
62701	GNQ01
27821	go mobile
20201	GR COSMOTE
20209	GR Q-TELECOM
73802	GUY CLNK PLS
73801	GUY TW
21601	H PANNON GSM
311110	High Plains
31070	Highland
45400	HK CSL
45402	HK CSL
45418	HK CSL
45410	HK NEW WORLD
72423	TELEMIG CEL
70603	TELEMOVIL
41006	Telenor PK
23820	TELIA DK
24001	TELIA S
50501	Telstra Mobile
310900	Texas Cellular
61501	TG-TOGO CELL
52015	TH ACT 1900
52001	TH GSM
52023	TH GSM 1800
52018	TH-DTAC
71610	TIM
72402	TIM BRASIL
72403	TIM BRASIL
72404	TIM BRASIL
20210	TIM GR
43603	TJK MLT
51402	TLS-TT
31026	T-Mobile
31031	T-Mobile
310160	T-Mobile
310200	T-Mobile
310210	T-Mobile
310220	T-Mobile
310230	T-Mobile
310240	T-Mobile
310250	T-Mobile
310260	T-Mobile
310270	T-Mobile
310660	T-Mobile
23203	T-Mobile A
23001	T-Mobile CZ
26201	T-Mobile D
21630	T-Mobile H
21901	T-Mobile HR
20416	T-Mobile NL
23102	T-Mobile SK
28602	TR TELSIM
28601	TR TURKCELL
37412	TSTT
60503	TUNISIANA
60502	TUNISIE TELECOM
46697	TWN GSM 1800
46693	TWN MOBITAI
25506	UA life:)
25501	UA UMC
42402	UAE ETISALAT
25505	UA-GT
25503	UA-KYIVSTAR
53901	U-CALL
64101	UG CelTel
25502	UKR-WellCOM
41603	UMNIAH
72207	UNIFON

45412	HK PEOPLES
45416	HK SUNDAY
70830	HND
74401	HOLA PARAGUAY S.A.
21910	HR VIP
65401	HURI
40401	Hutch
40405	Hutch
40411	Hutch
40413	Hutch
40415	Hutch
40430	Hutch
40484	Hutch
40486	Hutch
40488	Hutch
40566	Hutch
41308	Hutch
45503	Hutchison MAC
22201	I TIM
22288	I WIND
71201	I.C.E.
40404	IDEA
40407	IDEA
40412	IDEA
40419	IDEA
40422	IDEA
40424	IDEA
40456	IDEA
40478	IDEA
26003	IDEA, PL IDEA, PL 03
61002	IKATEL ML
42502	IL Cellcom
42501	IL ORANGE
42503	IL Pelephone
22807	In&Phone
40442	INA AIRCEL
40441	INA RPG
40414	INA SPICE
40444	INA SPICE
51011	IND - Excelcom
40440	IND AIRTEL
40551	IND AirTel
40552	IND AirTel
40553	IND AirTel
40554	IND AirTel
40555	IND AirTel
51001	IND INDOSAT
51021	IND INDOSAT
51010	IND TELKOMSEL
40470	INDH1
31130	Indigo
64101	UG CelTel
25502	UKR-WellCOM
41603	UMNIAH
72207	UNIFON
63102	UNITEL
25039	Uraltel
74810	URYAMWU
310870	US
31020	US - Union Telephone
310100	US PLATEAU
310320	USA-CellularOne
310590	USA - Extended Area
310690	USA - Immix Wireless
31080	USA 080
310340	USA 340
310640	USA AE Airadigm
310630	USA AmeriLink
310190	USA Dutch Harbor
310400	USA i CAN
311250	USA i CAN
31100	USA Mid-Tex Cellular, Ltd
310790	USA Pinpoint
31046	USA SIMMETRY
310950	USA XIT
310950	Cellular
310880	USAACSI
311190	USAC1ECI
31170	USAEC
310910	USAFC
31190	USASXLP
31040	USATX
310530	USA-WVA WIRELESS
64111	UTL-Mango
43405	UZB CSOCOM GSM
43404	UZB DAEWOO-GSM
43407	UZB-UZD
27404	Viking
73601	VIVA
45201	VN MOBIFONE
45202	VN VINAPHONE
45204	VNM and VIETTEL
64004	VodaCom
63001	VODACOM CD
65101	Vodacom Lesotho
64304	VodaCom-MZ
65501	VodaCom-SA
27602	vodafone AL
50503	vodafone AU
60202	vodafone EG
21401	vodafone ES
20205	vodafone GR
21670	vodafone HU
27201	vodafone IE
22210	vodafone IT
44020	Vodafone JP

43602	Indigo-T
310770	Iowa Wireless USA
43214	IR KISH
43219	IR MTCE
43232	IR, VALIACOM
41830	IRAQNA
27203	IRL-METEOR
43211	IR-TCI
27401	IS SIMINN
51501	ISLACOM
42505	JAWWAL-PALESTINE
41677	JO MobCom
44010	JP DoCoMo
28802	KALL
46688	KGT-Online
45602	KHM-Hello GSM
54509	KL-Frigate
45005	KOR SK Telecom
46703	KP SUN
45002	KR KTF
45008	KR KTF
21670	vodafone HU
27201	vodafone IE
22210	vodafone IT
44020	Vodafone JP
27801	vodafone MT
20404	vodafone NL
53001	vodafone NZ
26801	vodafone P
24008	vodafone SE
23415	vodafone UK
26202	Vodafone.de
54101	VUT SMILE
73401	VZ INFO
41007	WaridTel
23450	wave
31101	Wilkes USA
31105	Wilkes USA
50502	YES OPTUS
22001	YU MOBTEL
22003	YUG 03
64003	ZANTEL-TZ
27801	vodafone MT
20404	vodafone NL
53001	vodafone NZ
26801	vodafone P
24008	vodafone SE
23415	vodafone UK
26202	Vodafone.de
54101	VUT SMILE
73401	VZ INFO
41007	WaridTel
23450	wave
31101	Wilkes USA
31105	Wilkes USA
50502	YES OPTUS
22001	YU MOBTEL
22003	YUG 03
64003	ZANTEL-TZ
64501	ZM CELTEL
64804	ZW ECONET
64801	ZW NET*ONE